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The Glacial History of Nantucket and Cape Cod, with an argument for a fourth centre of glacial dispersion in North America.

By J. Howard Wilson. x and 90 pp., 38 plates and maps, and 13 figures.

The Macmillan Company. 8vo, illustrated, cloth. (\$2.50 net.)

This book is a distinct addition to our knowledge of the glacial history of eastern North America. It is the result of studies for the Doctorate of Philosophy at Columbia University. The matter is treated in five chapters.

Chapter I gives a general discussion of the region and of previous work in it. Chapter II discusses the Wisconsin Ice Sheet, and the evidence for the existence of two lobes—the Nantucket and Long Island lobes. Two retreating stages are demonstrated in southern New England. The first is marked by the lower moraine of Long Island, Block Island, and the western end of Martha's Vineyard, for the Long Island lobe; and by the eastern end of Martha's Vineyard, Nantucket, and an unknown eastward extent for the Nantucket lobe. The interlobate moraine is formed by the hills on the eastern shore of Buzzard's Bay and northward in Plymouth. The second stage is marked by the northern moraine of Long Island, Fishers Island, and the Elizabeth Islands for the Long Island lobe; and by the backbone of Cape Cod for the Nantucket lobe.

Chapter III describes the preglacial and early glacial formations of Nantucket, and Chapter IV gives an account of the Sankaty Head beds of Nantucket. The author believes that considerable erosion has occurred since the region was studied by Desor and Cabot in 1849, so that the lower clays are no longer visible, their dip having carried them below the erosion level. A detailed section is given of the beds as exposed by excavations made by the author for the purpose. An analysis of the material of each bed was made to determine if possible its mode of origin. Sixteen beds are differentiated, and the Pleistocene fossils found in eight of them are listed, with their relative abundance indicated. Altogether 81 species are listed; 11 of these are from earlier lists and not found by the author. He adds to the former list 21 species which had not been found before. The author interprets the fossiliferous beds as having accumulated *in situ*, in an inlet or lagoon in Inter-glacial time.

Chapter V considers the deposits made by the Wisconsin Ice Sheet. The front of the ice is marked by the steep ice-contact slope of the apron plain, the kame hills being formed under the ice or as a feature of retreat. Several well-defined channels can be traced across the island.

Chapter VI briefly discusses Martha's Vineyard and Block Island, and Chapter VII considers the moraine of upper Cape Cod, the Elizabeth Islands, and Fisher's Island.

Chapter VIII describes a glacial lake which occupied part of Cape Cod Bay, and in which the plains of Eastham, Wellfleet, and Truro were deposited as delta sand-plains, as outlined by Grabau in 1896. The lake is named in memory of the late Professor N. S. Shaler, "whose name is indissolubly linked with the history of geologic science in New England." Four stages of the lake are recognized. These were embayments in the front of the ice-sheet and their southern shoreline was the terminal moraine. Each of the successive stages was determined by the opening of successively lower outlets across the moraine, the outlets being readily correlated with the plains formed during these successive stages. The outlines of the successive lake stages are represented on a series of maps.

Chapter IX gives the argument for a fourth centre of glacial dispersion in North America. Many citations are given from the glacial literature of New

England and Canada, which show difficulties in accounting for the facts on the hypothesis of one centre of accumulation in Labrador.

The author concludes thus:

It would seem as if we had evidence enough to seriously consider the possibility of the former existence of an active ice-sheet on Newfoundland, and indeed, I can hardly see how we can escape the belief that during the last glacial period this Newfoundland area was occupied by an ice-sheet of such magnitude and such activity as to be able to send its lobes and glaciers to the edge of the continental shelf, and southwesterly even as far as Cape Cod and Nantucket.

F. P. G.

L'Influenza italiana nella Grandezza di Spagna—Alessandro Malaspina e la Relazione del suo Viaggio. Per Augusto Zeri.

This separate print from the "*Rivista Marittima*" deals with: First, a brief mention of the many Italians that distinguished themselves in the service of Spain, beginning with the war against the Mohammedans from 1116 to 1230, when Italian leaders commanded the Spanish navy. Second, the life of Alessandro Malaspina and his voyage, and the fate of his writings.

A chart of Malaspina's voyage (1789-1794) prefaces the title. The tone of the first section is moderately fair, Italian ability and prowess are naturally placed in the foreground, and it cannot be denied that, at sea, the Spanish navy held its own only as long as it was under the leadership of Italian commanders. But it is going too far to assert that the greatness of Spain was born and grew with Italian assistance and began to decline as soon as the Italians withdrew their co-operation. There were other and more potent causes instrumental in bringing about both the rise and the fall of Spanish power.

The voyage of Malaspina has attracted as yet but modest attention, for the reason that the original report, written mostly by Malaspina himself and consisting of sixteen volumes in folio, with numerous illustrations, was only discovered in 1868 and but part of it published (in 1885) by Pedro de Novo y Colson. This publication forms a volume of 700 pages folio and the editor asserts it is only a small portion of the whole.

The temporary loss of Malaspina's manuscript is due, as well established, to the apparently most unjust treatment of its author by the Spanish Government, after his return in 1795. It is known that Malaspina, two years afterwards, was imprisoned and kept in durance for five years, his papers and other documents being confiscated. In 1802, in consequence of threatening letters by the First Consul Bonaparte, he was released and allowed to return to Italy, where he died in 1809, at the age of 54 years.

The publication of de Novo y Colson embraces, as stated by himself, only one-seventh of the report of Malaspina. The whole consisted of five sections, and there remain to appear in print five and the charts and maps. Signor Zeri devotes the close of his interesting pamphlet to an appeal to his country, urging Italy to take in hand the publication of the whole. It would not only be an act of justice to the memory of a distinguished and much-injured man, but a highly valuable contribution to knowledge. Now that the United States hold the territory which Malaspina explored on the northwestern coast (he reached latitude 60° 20' in Alaska), it may be asked if we also have not a direct interest in the publication of the remainder of his writings?

From the farthest point north, reached on our Pacific coast, Malaspina sailed southward to Acapulco, hugging the coast rather closely and exploring it to a certain extent. The report on his visit to the Philippines might also be of interest to the public of the United States under present circumstances. A. F. B.